PART III

PHYSICAL DESCRIPTION

Physical Regions of Washington

On the basis of surface features, Washington may be divided into eight general regions. Agricultural settlement is influenced by factors of topography, climate, soil, forest vegetation and water resources distinctive to each of the physiographic regions. Each has become a different type of farming area as settlers have learned to adapt crops and livestock to the conditions, or have improved limitations through drainage or irrigation.

Coastal Plains

A narrow, sandy plain with shallow bays, tidal flats, stream deltas and low headlands lies between the coastline and the Coast Range. It extends from the Columbia River mouth almost to Cape Flattery, being widest and lowest in the Grays Harbor and Willapa Bay districts. The climate is mild and damp with a long growing season, but it is too cool, cloudy and wet for most crops. Originally, this area was covered with heavy forests but much of it is now covered with woodlands. Lumbering and manufacture of wood products is the main industry. Farming is largely livestock and dairying on low uplands and drained areas in the lower Chehalis River Valley. Cranberry growing is important and well-adapted to numerous, boggy areas in the Grays Harbor and Willapa Bay sections. The shallow bays are also used for oyster culture. Fishing is common in the rivers and coastal banks.

Coast Range

The Coast Range is an uplifted area of sedimentary and metamorphic rocks divided into the Olympic Mountains and the Willapa Hills. The Olympics tower to nearly 8,000 feet in a dome-like structure, carved deeply by rivers. These mountains have the heaviest precipitation in the state. Snowfields and heavy forest cover the mountains. Most of the wilderness area is within the Olympic National Forest and Olympic National Park, being managed for recreation, wildlife and timber. Farm settlement is limited to some foothill river plains and coastal terraces such as the Dungeness and Port Angeles districts along the Strait of Juan de Fuca. Here in the lee of the mountains, rainfall is moderate and irrigation is practiced by some livestock farmers. The Willapa Hill country is wet, heavily forested and carved into numerous narrow valleys. Logging is the main industry, combined with livestock farming in the upper Chehalis River Valley and along the banks of the Columbia River. Wet climate, hilly topography and the difficulty of clearing stump land retards agriculture.

Willamette-Puget Sound Lowland

A broad lowland, described as a trough or valley, lies between the Coast Range and the Cascade Mountains. The northern part is the Puget Sound Lowland which has been glaciated and is occupied by the sea in the lowest sections. The continental glacier reached slightly south of Olympia. Under a warming climate it melted and geologists believe it receded about 25,000 years ago, leaving an infertile plain of moraines and outwash gravels, sands and clays known today as the Puget Glacial Drift Plain. Its rolling surface has numerous lakes and bogs.

Most of the major cities--Seattle, Tacoma, Everett, Bellingham and Olympia--have been built on moraines bordering the Sound. Rivers such as the Nooksack, Skagit, Snoqualmie, White and Puyallup have built up deltas and flood plains over the older gravelly plains. These narrow valleys are more fertile than the older glacial plains and support numerous small dairy, vegetable and berry farms. Most of the gravelly areas are wooded with a second-growth forest and are used for pastures. In the southern part of the Willamette-Puget Sound Lowland, there are two large valleys--the Cowlitz and Chehalis. They drain a low, hilly area with several flat prairies and bottom lands.

Agriculture is handicapped by poor drainage and flooding of the river deltas and plains, by heavy winter rainfall, by cloudy but dry summers, by coarse, gravelly upland soils and by densely wooded land which is costly to clear. Advantages are mild climate and a location close to major markets for farm products such as milk, poultry and vegetables.

Cascade Mountains

The Cascades are a wide and high topographic and climatic barrier which separates western and eastern Washington. The range is made up of sedimentary, igneous and metamorphic rocks which have been carved by glaciers and streams. High, isolated volcanic cones of lava such as Mt. Adams (12,307 feet), Mt. Rainier (14,408 feet), and Mt. Baker (10,791 feet), appear upon the older Cascade rocks. The Cascade crest varies between 10,000 and 3,000 feet and is higher and more rugged in northern Washington. Roads and railroads have been built across its lower passes in central and southern Washington. The Columbia River has cut a deep gorge and the lowest pass through the barrier. The western slope is wet and heavily forested with Douglas fir. The eastern slope is drier with a less-dense pine forest. Nearly all classified as forest land, most of the area is in Federal ownership in five national forests and Mount Rainier National Park. Tree fruit farming in the eastern slope valleys of Wenatchee, Chelan, Methow, Naches and the Columbia Gorge is most important. Sheep and cattle summer grazing on alpine grasslands is another use. Deep western slope valley bottoms such as the Skagit, Snoqualmie, Nisqually, Cowlitz and Lewis also contain livestock farms. The area is vitally important as a source of water for irrigation and city drinking water and as a source of timber. Steep terrain, wet climate, short growing seasons and heavy forest vegetation are main handicaps for agriculture.

Columbia Basin

A low plateau of old lava rocks covered with stream and wind-deposited soils extends in a series of plains, ridges, coulees and hills from the Cascades to the eastern Washington border. The area is basin-like in structure, being higher around its margins and sloping inward to low and level central plains. It has been sharply eroded by the Columbia River and its interior tributaries, the Snake, Yakima, Palouse and Spokane Rivers. The basin has sub-areas created by crustal movements and erosion.

A. The Yakima Folds are a series of hilly ridges extending from the Cascades eastward into the lower part of the basin. The Yakima and Columbia Rivers have cut gaps through the ridges, and built up plains in the troughs between them. The rich, alluvial plain of the Yakima River is an important irrigated valley.

B. The Waterville Plateau is a tableland of thin soils overlaying basaltic rock at an elevation of 2,500 to 3,000 feet. It has gorges cut by the Columbia River and ancient glacial outwash streams once flowing in Moses and Grand Coulees. It is too high for irrigation and is used for dryland grain and livestock farming. The high plain is often called the Big Bend Country.

C. The Channelled Scablands is a belt of dry terrain carved by ice-age rivers into a series of coulees. Bare rock is exposed in the coulees. Small plateaus between the old river channels have thin soils used for dryland farming. The Grand Coulee of this region has been developed into a major irrigation reservoir.

D. The Palouse Hills consist of fertile deposits of wind-blown soil overlaying basaltic lava flows. After being deposited in large dunes, the formation was reshaped by streams into an intricate pattern of low, rounded hills which are tilled for wheat, barley and legumes. The hills receive 16 to 25 inches of rainfall annually and are composed of deep, porous and fertile soils. It is one of the richest farming areas of the Pacific Northwest.

E. The Central Plains are low and relatively level expanses of soil, deposited by old streams crossing the Channelled Scablands and later by the flooding of the Yakima, Columbia, Snake and Walla Walla Rivers. Climate is desert-like (6-12 inches of precipitation per year). The lower lands of the area, the Quincy and Pasco Basins and the Walla Walla Valley, are irrigated. The Quincy Basin is a new irrigation area watered by Grand Coulee Dam.

Agricultural handicaps in Columbia Basin regions are mainly found in its dry, continental climate. Large irrigation systems built since 1900 have overcome much of the need for water on rich valley and basin soils. Dryland farming in higher areas is practiced widely, although occasional variations in rainfall, lack of snowfall, winterkill, water and wind erosion inflict damage to field crops and to livestock ranges.

Okanogam Highlands

A portion of the Rocky Mountains, consisting of well-eroded old granites, lavas and sedimentary rocks extends across north-central Washington. These are the Okanogan Highlands, the state's richest mineral area. Summit levels reach 4,000 to 5,000 feet with peaks exceeding 7,000 feet. Prominent north-south valleys are occupied by irrigated tree fruit and livestock farms. These are the Okanogan, Sanpoil, Kettle and Colville Valleys. The Columbia River gorge through the Okanogan Highlands is occupied by the large man-made lake behind Grand Coulee Dam--Roosevelt Lake. Higher and wetter portions are forested with pine and larch and are managed for timber and for livestock ranges by the United States Forest Service and the Bureau of Indian Affairs. Cold winter temperatures, short growing seasons, dry valley climates and distance from markets are farming handicaps.

Selkirk Mountains

The Selkirks, a range of the Rocky Mountain system, extend into the northeast corner of Washington. The rocks are old mineralized granites and metamorphics reaching elevations of over 7,000 feet. The Pend Oreille River Valley at the

base of the Selkirks is an agricultural area of narrow bottomlands settled by livestock farmers. Nearly all of the uplands are in Kaniksu National Forest. While climate is cool and growing seasons are short, the Pend Oreille Valley has an advantage of being closely located to the Spokane metropolitan market area.

Blue Mountains

The Blue Mountains are an uplifted and eroded plateau extending into the southeastern corner of Washington. The strata are mainly ancient crystalline rocks which contain some minerals. The highest point of the mountains in the Washington section is Diamond Peak (6,401 feet), located on the divide between the Grande Ronde, Tucannon and Touchet Rivers. These rivers, and the Walla Walla River, have cut valleys into the plateau. Extensive pine forest and grassland areas are in the highlands within Umatilla National Forest, where rainfall is 30 to 40 inches. The Snake River has cut a deep valley and gorge across the lower parts of the mountains. The area is well developed agriculturally around its northern foothills where wind-blown soils are deep and irrigation systems are used. The Walla Walla and Tucannon Valleys are rich grain, legume and livestock areas of irrigation and dry farming. Grazing is an important use of the highlands by livestock ranchers in the upper vallays.

Topography of Walla Walla County

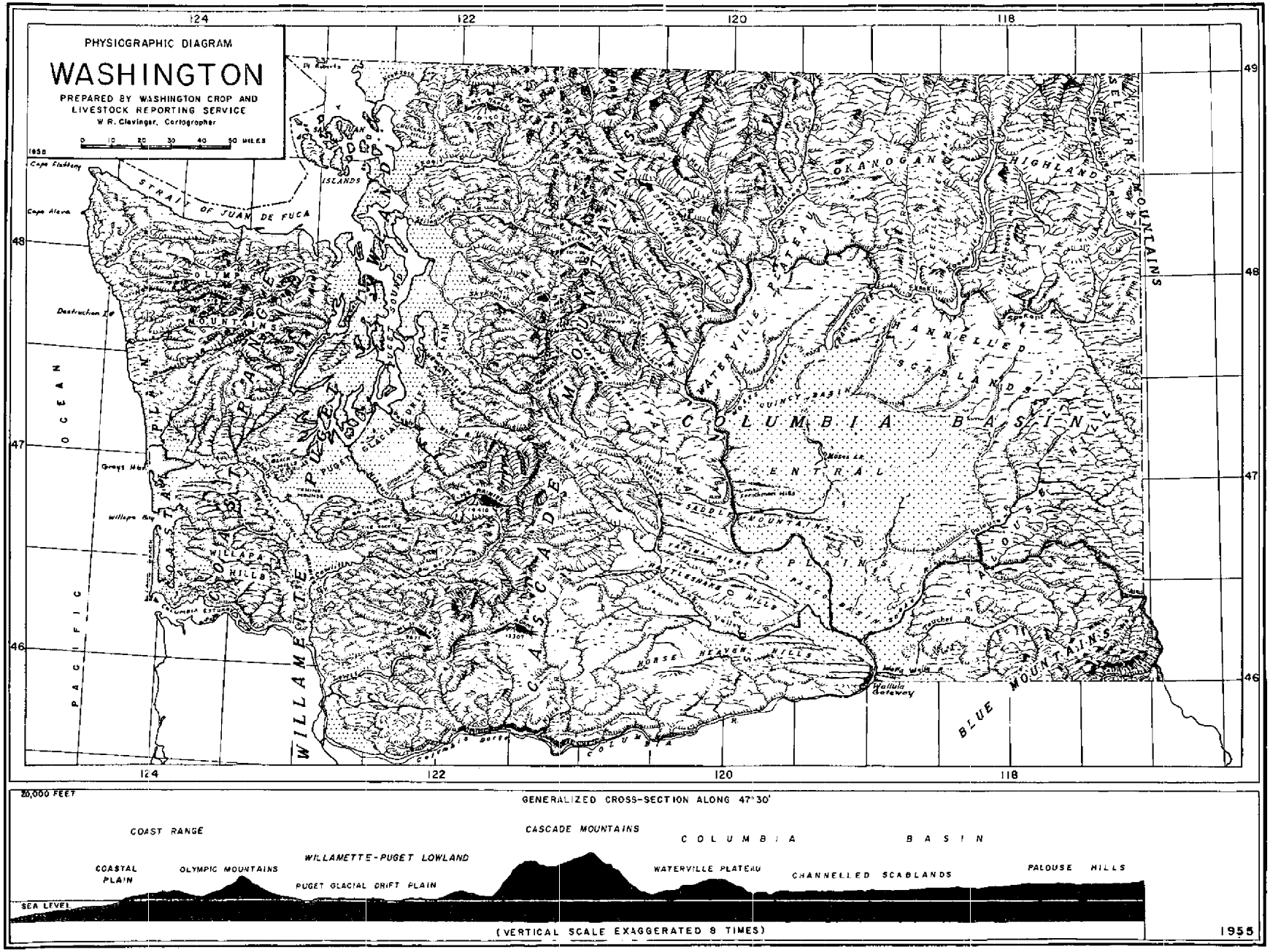
Walla Walla County lies within two distinct physiographic regions. The first is the Palouse Hills subregion of the Columbia Basin which covers the entire county except the southeastern section. The second is the Blue Mountains, a portion of which occupies the southeastern corner of the county.

Walla Walla County is primarily a region of rolling and hilly plains. Most of the county is accessible and suitable for agriculture. Eureka Flats and the Walla Walla and Touchet River Valleys are the principal cropland areas. Most of the low hills are covered with wind-deposited soils. The area is underlain with deep beds of Columbia Plateau basalts. Rough, stony lands are found in the Blue Mountains and along the steep sides of the Snake River where beds of basaltic rock are exposed. Wind and water erosion have smoothed most of the hilly surface into an undulating, rolling topography.

Elevations are moderate over most of Walla Walla County. It ranges from 300 to 500 feet above sea level on the Columbia River plains in the western part of the county to heights of 3,500 to 4,500 feet in the Blue Mountains. Walla Walla Valley ranges between 350 to 500 feet in elevation while the Touchet Valley is from 400 to 1,000 feet. Eureka Flats is an extensive rolling plain with elevations between 800 and 1,100 feet.

Climate

The relationship of weather and climate to agriculture is very close. The climate of any region not only accounts for the patterns of plant life that are native to the area but is an important factor in what man shall grow there. Variations in weather may either stimulate or destroy crops in the process of development. These and other factors make weather and climate basic to the over all study of agriculture for any given area.


PHYSIOGRAPHIC DIAGRAM
WASHINGTON
PREPARED BY WASHINGTON CROP AND LIVESTOCK REPORTING SERVICE
W. R. Clevinger, Cartographer
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1958
124
122
120
118
49
48
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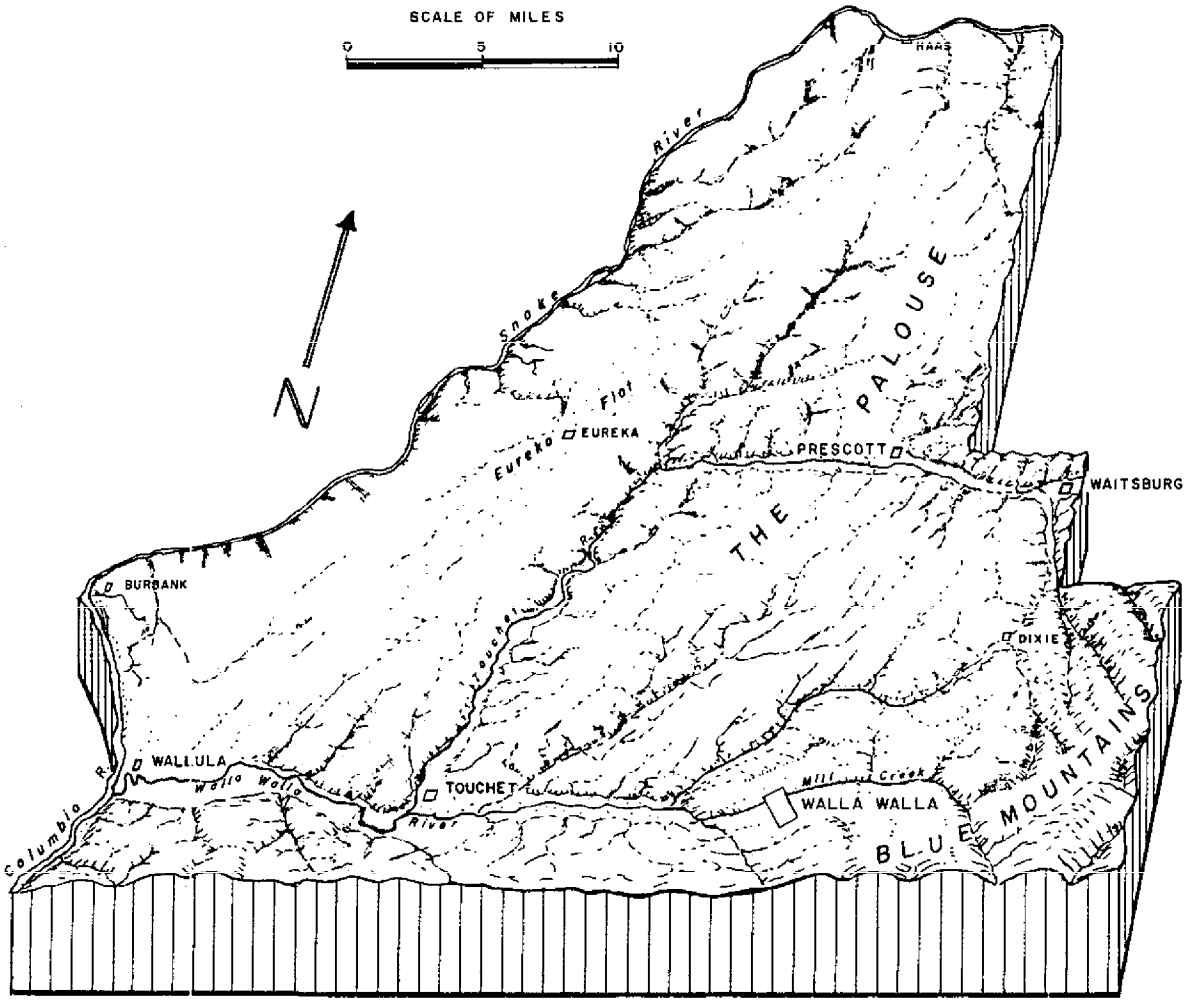
46
PACIFIC OCEAN
STRAIT OF JUAN DE FUCA
SAN JUAN ISLANDS
OLYMPIC MOUNTAINS
COAST RANGE
PUGET SOUND
WILLAMETTE-PUGET LOWLAND
PUGET GLACIAL DRIFT PLAIN
WILLAPA HILLS
CASCADE MOUNTAINS
OKANOGAN HIGHLAND
SELKIRK MOUNTAINS
COLUMBIA BASIN
WATERVILLE PLATEAU
CHANNELLED SCABLANDS
CENTRAL PLAINS
SADDLE MOUNTAINS
HORSE HEAVEN HILLS
PALOUSE HILLS
BLUE MOUNTAINS
Wallula Gateway
20,000 FEET
GENERALIZED CROSS-SECTION ALONG 47°30'
COAST RANGE
CASCADE MOUNTAINS
COLUMBIA BASIN
COASTAL PLAIN
OLYMPIC MOUNTAINS
WILLAMETTE-PUGET LOWLAND
WATERVILLE PLATEAU
CHANNELLED SCABLANDS
PALOUSE HILLS
PUGET GLACIAL DRIFT PLAIN
SEA LEVEL
(VERTICAL SCALE EXAGGERATED 8 TIMES)
1958

TOPOGRAPHIC DIAGRAM

WALLA WALLA COUNTY



WASHINGTON CROP AND LIVESTOCK REPORTING SERVICE

W.R. CLEVINGER.

Climatically, Walla Walla County falls within the semi-arid classification in which precipitation ranges from about 10 to 20 inches per year and falls largely in the late autumn, winter and spring. It is a land where evaporation exceeds precipitation over a period of time. This condition results largely from the area's interior location east of the Cascade Mountains. The north-south oriented Cascade Range allows only a small portion of the moisture-laden, westerly moving air masses to penetrate into eastern Washington. Walla Walla County's climate is characterized by cold winters and hot summers as well as a high diurnal range of temperatures.

The climatic pattern of the county is closely related to elevation. Temperatures, frost conditions, growing seasons and precipitation vary within Walla Walla County's boundaries. Generally speaking, conditions are warmer and drier in the western part of the county and slightly cooler and wetter to the east.

The average maximum temperature during the warmest months ranges from 80 to 90 degrees over most of the agricultural areas of Walla Walla County 1/. Average temperatures during the summer are a few degrees warmer in the western part of the county and in the lowlands around the city of Walla Walla than in the areas to the northeast in the vicinity of Waitsburg. Heat extremes of over 110 degrees have been recorded in the city of Walla Walla. Winter average minimum temperatures during January run around 25 to 30 degrees. During a few cold winters, the thermometer has dropped to -23 at the Weather Bureau station near the city of Walla Walla. Variations in temperatures in the county are mainly related to differences in elevation.

Table 5. Temperature Data
Average Maximum, Average Minimum, Mean, Highest and Lowest Temperature Each Month
Walla Walla County, 1931-1960

Station		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Walla Walla (City) (949' elev.)	Av. Max.	39.0	44.9	54.4	63.8	72.0	78.7	89.2	86.6	77.9	64.6	48.8	43.8	63.6
	Av. Min.	27.4	31.8	37.6	43.7	49.9	55.6	62.7	61.0	54.1	45.6	35.7	31.7	44.7
	Mean	33.2	38.4	46.0	53.8	61.0	67.2	76.0	73.8	66.0	55.1	42.3	37.8	54.2
	Highest	69	71	79	93	99	106	112	113	103	88	77	73	113
	Lowest	-16	-14	13	19	28	41	46	45	26	15	1	-14	-16
Walla Walla (Station 3 miles west) (800' elev.)	Av. Max.	39.0	47.2	55.7	66.4	74.8	80.7	91.2	88.2	80.1	65.7	50.1	42.6	65.1
	Av. Min.	24.7	30.9	34.2	40.1	46.7	51.7	57.1	59.3	48.5	40.8	33.3	30.1	41.5
	Mean	31.9	39.1	45.0	53.3	60.8	66.2	74.2	73.8	64.3	53.3	41.7	36.4	53.3
	Highest	67	69	79	93	100	103	108	108	102	87	77	70	108
	Lowest	-22	-23	16	17	28	36	39	36	30	13	6	-6	-23
Dayton 2/ (1,620' elev.)	Av. Max.	39.2	44.1	52.7	62.2	70.4	76.8	87.5	85.2	77.1	64.6	48.9	42.0	62.6
	Av. Min.	24.0	28.3	33.0	38.4	44.2	49.4	53.8	52.4	46.8	39.4	31.5	28.5	39.2
	Mean	31.6	36.2	43.0	50.3	57.3	63.1	70.7	68.8	62.0	52.0	40.2	35.3	50.9
	Highest	67	71	77	93	99	101	109	106	105	92	73	69	109
	Lowest	-22	-22	6	17	23	29	34	34	24	7	-10	-9	-22
Kennewick 2/ (392' elev.)	Av. Max.	38.5	46.2	57.7	68.3	76.7	83.0	91.3	88.3	79.8	66.2	49.7	42.0	65.6
	Av. Min.	25.1	28.8	34.5	40.6	47.8	53.6	58.8	56.5	49.4	41.1	32.7	30.0	41.6
	Mean	31.8	37.5	46.1	54.5	62.3	68.3	75.1	72.4	64.6	53.7	41.2	36.0	53.6
	Highest	64	71	82	94	102	106	115	106	100	89	76	68	115
	Lowest	-19	-23	10	18	30	37	43	40	30	14	0	-8	-23

Source: U. S. Weather Bureau, Climatological Office.

1/ All temperature figures are given in Fahrenheit.
2/ Dayton is located in Columbia County 10 miles northeast of Waitsburg in eastern Walla Walla County. Kennewick is located in Benton County about 5 miles from the western border of Walla Walla County near Burbank.

Table 6. Probability of Freezing Temperatures -- Walla Walla County 1/

STATION	TEMP. (° F)	PROBABILITY — SPRING					PROBABILITY — FALL					Growing Season Mean Length (Days)
		90%	75%	50%	25%	10%	10%	25%	50%	75%	90%	
Walla Walla 3W	32	Mar 26	Apr 7	Apr 21	May 5	May 17	Sep 15	Sep 26	Oct 9	Oct 22	Nov 1	171
	28	Mar 9	Mar 20	Apr 3	Apr 17	Apr 28	Oct 5	Oct 15	Oct 28	Nov 10	Nov 21	208
	24	Feb 19	Mar 4	Mar 17	Mar 30	Apr 12	Oct 20	Oct 30	Nov 13	Nov 26	Dec 28	241
	20	—	Feb 1	Feb 18	Mar 4	Mar 16	Nov 5	Nov 18	Dec 5	—	—	290
	16	—	Jan 13	Jan 31	Feb 15	Feb 28	Nov 15	Nov 28	Dec 23	—	—	326

Source: U. S. Weather Bureau, Climatological Office.

1/ To illustrate the data in the table, we find that the 50 percent probability of a 32° spring freeze for Walla Walla is April 21. But there is also a 25 percent chance (1 year in 4) that a 32° freeze will occur as late as May 5, and 10 percent chance as late as May 17.

The length of the growing season varies slightly within the county, being longer in the western areas than in the eastern sections. In the Walla Walla Valley around the city of Walla Walla, the growing season is 171 days. The season generally runs from April 21 to October 9. The length of the growing season is defined as the average number of days between the last occurrence of a 32 degrees freeze in the spring and the first such occurrence in the fall.

Table 7. Precipitation in Inches - Walla Walla County

Station	Elevation (ft.)	Period of Record	Average Annual	Greatest Annual	Least Annual	Greatest Monthly	Least Monthly	Greatest Daily
Mill Creek	2,000	1931-50	39.56	51.90	24.71	13.19	0	3.58
Pleasant View	1,650	1931-60	12.53	18.04	7.85	4.92	0	1.43
Walla Walla (city)	949	1931-60	15.50	21.60	10.12	4.52	0	2.02
Walla Walla 3W	800	1931-60	15.33	19.98	10.70	4.33	0	1.45
Kennewick 1/	392	1931-60	7.49	12.90	4.05	3.57	0	1.42
Dayton 1/	1,620	1931-60	19.53	33.52	12.07	6.25	0	2.08

1/ Kennewick is located in Benton County about 5 miles from the western border of Walla Walla County near Burbank. Dayton is located in Columbia County 10 miles northeast of Waitsburg in eastern Walla Walla County.

Source: U. S. Weather Bureau, Climatological Office.

Isohyets (lines connecting points of equal precipitation) follow closely the contour lines in Walla Walla County. Moisture is released by air masses as they are forced to ascend the higher elevations in the county. Therefore, precipitation varies from an average of about 8 inches annually around Burbank located in the western part of the county to over 40 inches in the Blue Mountains in the southeastern section. Annual precipitation, however, is under 20 inches over most of the county.

Summers are dry with very little rainfall. Irrigation is required in the growing of vegetables and certain other crops. During the winter, storms are more numerous and more intense. Most of area's precipitation consequently falls in late autumn, winter and spring.

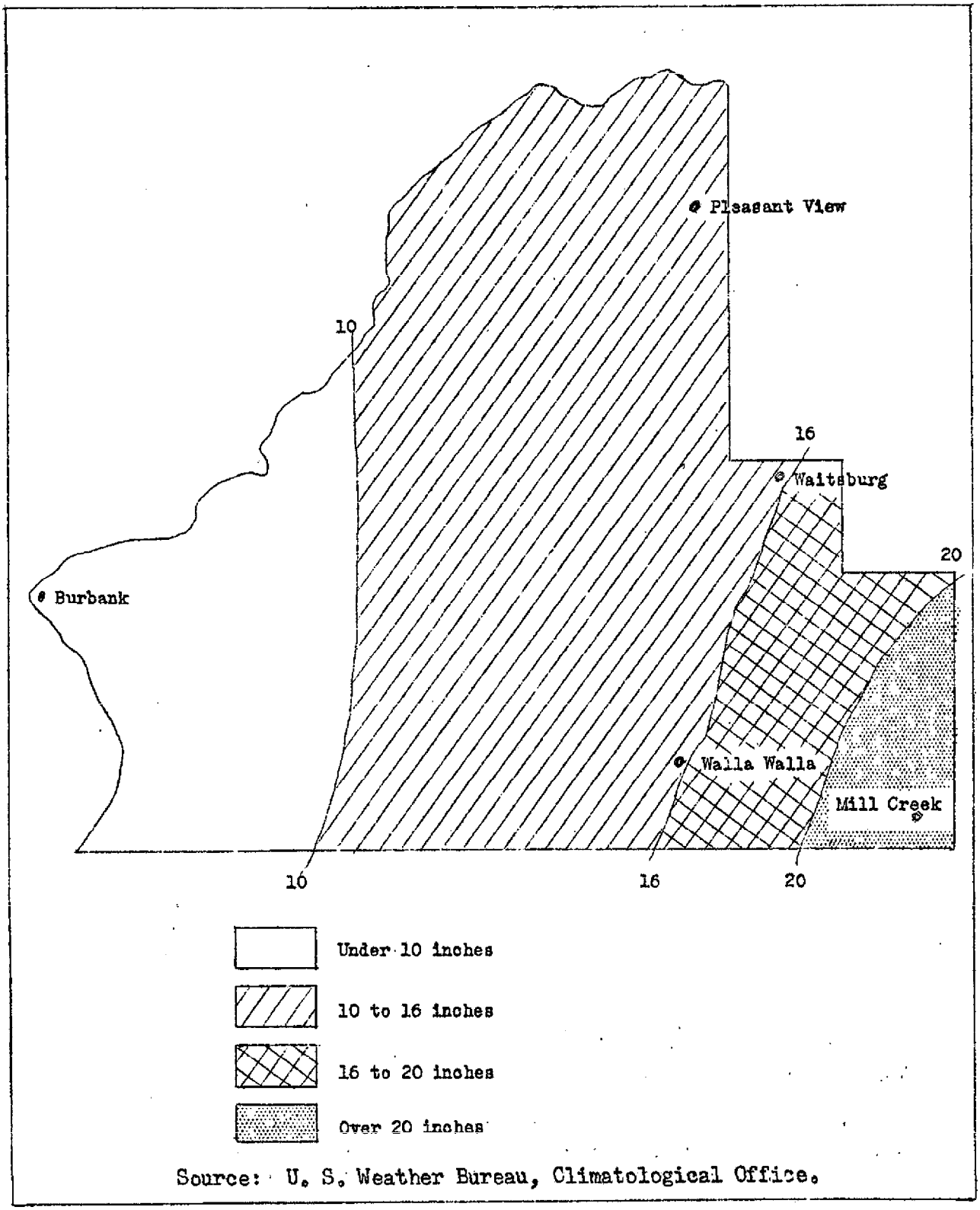


Figure 5. Distribution of Precipitation
Walla Walla County

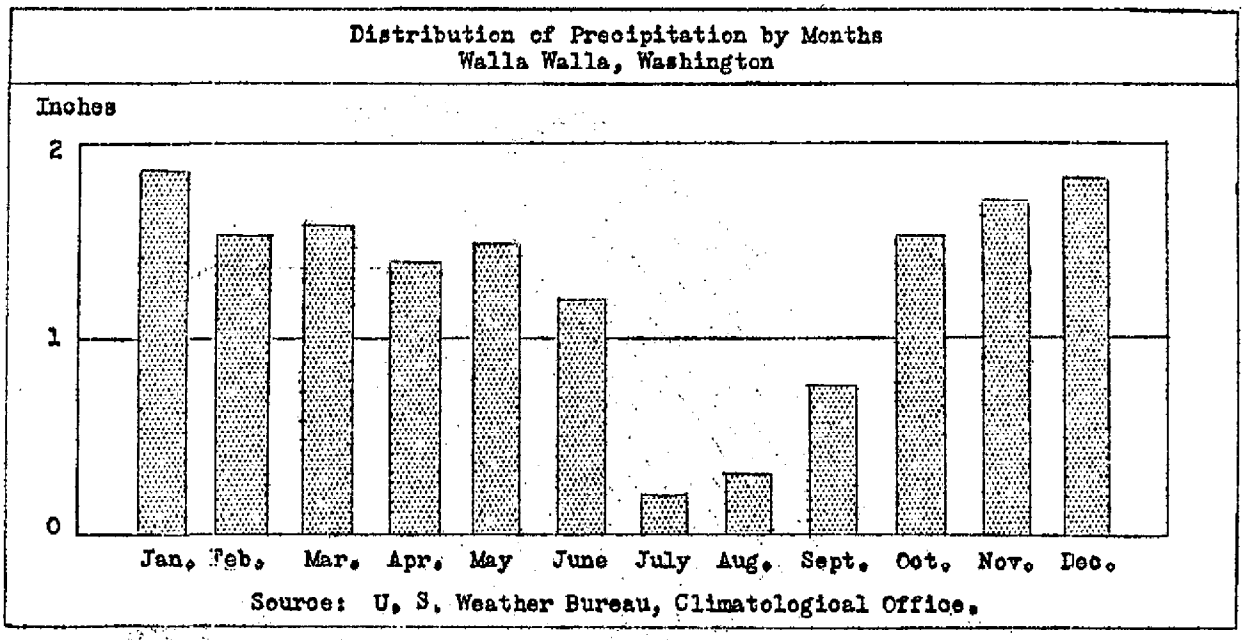


Figure 6. Distribution of Precipitation by Months
Walla Walla, Washington

Forest and Wildlife

According to a Forest Service survey in 1957, Walla Walla County contained about 23,000 acres of commercial forest land which represented 2.9 percent of the county 1/. Forests are found only in the Blue Mountains in the southeastern part of the county. Douglas fir, the major type, constituted 44 percent of this. Other types include Ponderosa pine, White fir and Western larch. In 1957, the net volume of live sawtimber in commercial forest land in the county was estimated to amount to 152,000,000 board feet.

In 1957, about 81 percent of the commercial forest lands in Walla Walla County was owned privately. The federal government owned 11.5 percent mainly as Umatilla National Forest. The remaining 7.5 percent was in state ownership. Timber harvested from all ownerships in 1961 amounted to 5,579,000 board feet from about 730 acres 2/. According to the Census of Agriculture, 11 Walla Walla County farms sold forest products worth $48,457 in 1959. Eight farms sold standing timber valued at $41,915.

Washington State Game Department statistics show a valuable harvest of game and fur animal resources from Walla Walla County's forests, streams and farmlands. In the 1962 season 340 deer and 200 elk were killed. Nearly 17,900 pheasants were bagged during 1962 as well as 10,820 ducks and 1,860 geese. Good rainbow trout, steelhead and salmon fishing is found in the Columbia, Snake, Touchet and Walla Walla Rivers. The wild fur catch during the 1962-1963 season in Walla Walla was as follows: 1,154 muskrat, 90 mink, 13 raccoon and 1 skunk.

1/ USDA, Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon. Forest Survey Report No. 136, Forest Statistics for Southeast Washington, July 1960.

2/ State of Washington, Department of Natural Resources, Olympia, Washington, Third Biennial Report, 1960-1962.

Land Classification and Soils

Land in Walla Walla County has been divided into seven broad classes and the soil classified into 51 types or series 1/. Over 75 percent of the land is classed as fair to good, suitable for growing irrigated specialty crops and dryland grain. Most of the soils are fertile loess (wind-deposited) of the Ritzville, Palouse, Athena and Walla Walla series ideal for grain. Alluvial soils (water-deposited) are found in narrow belts along the Walla Walla and Touchet Rivers. Stream deposited soils such as the Touchet, Onyx, Ahtanum and Umapine series were derived from basaltic rock mixed with loess. These soils are highly productive under irrigation.

The principal productive cropland area in the county is located in the upper Walla Walla Valley covering about 64,000 acres. Productivity of some of this area's Class II and III land has been improved through irrigation. Alluvial sandy-silt loam soils of the Onyx, Ahtanum, Umapine, Stanfield, Pedigo and Hermiston series are found in the river bottomland while most of the surrounding rolling uplands are mantled with the Walla Walla series--a chestnut colored, fine-textured, wind deposited soil.

Eureka Flats located in the northern part of the county contains over 45,000 acres of Class II and Class III lands devoted to growing wheat and barley under dryland methods. This area has two major soil series--Ritzville and Ellisforde. Ritzville is a fine, silt loam of wind-deposited origin formed under semi-arid grassland conditions. It is rich in minerals and its texture is such that it absorbs and retains moisture well. Wheat and barley are well adopted to these soils. Ellisforde is a thinner, wind-deposited soil occurring in small pockets on the Eureka Flats.

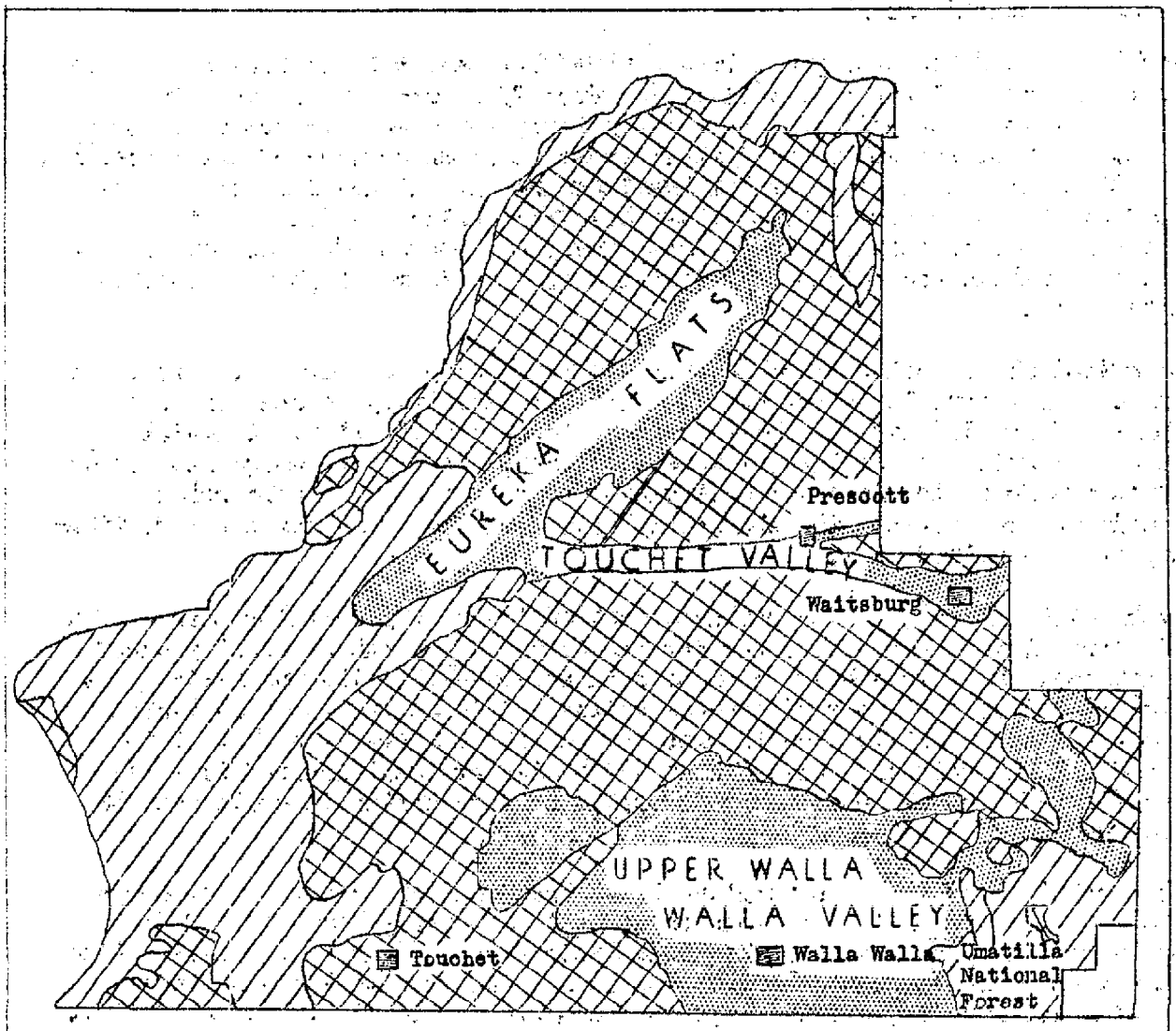
The Touchet River Valley bottomland is another area of good Class II croplands. Soils there are alluvial deposits of silty and sandy loams suited for orchards, vegetables, hay and miscellaneous field crops. Some of the valley land has been put under irrigation. The best soils are the Esquatzel and Ahtanum series in the lower valley and the Onyx and Hermiston series in the upper valley.

Elsewhere, Walla Walla County's sloping benchlands, gullies and areas of rock outcrop near the Snake River and in the Blue Mountain foothills contain less productive Class V, VI and VII lands. These lands are used mainly for grazing. Stony texture and poor moisture retaining characteristics of the soils in these submarginal lands make them unsuited for crops.

1/ Information on Walla Walla County land and soils has been obtained from two sources:

(1) Washington State University, Office of Conservation and Survey, Institute of Agricultural Science. Soils of Washington, Walla Walla County Section. Stations Circular 312, August 1957, Pullman, Washington.

(2) Washington Generalized Classification of Land According to its Capability for Use, Published Map by U. S. Soil Conservation Service and Washington State Agricultural Experiment Stations, cooperating, 1949.



Class I and II Land: Soil of high and better-than-average productivity; net income per farm is high.

Class III and IV Land: Moderately good and fairly good quality for cultivation.

Class V, VI and VII Land: Poor quality land; hilly terrain suited for grazing.

Source: Generalized from map, Washington Generalized Classification of Land According to its Capability For Use. Published by U. S. Soil Conservation Service and Washington State Agricultural Experiment Stations, cooperating. 1949.

Figure 7. General Quality of Land in Walla Walla County